

100G Vertical Cavity Surface Emitting Laser from the Ten ASEAN Countries



AI Overview

ASEAN countries are increasingly adopting 100G VCSEL technology, with Malaysia and Singapore leading assembly and testing for high-speed optical interconnects, while the region remains dependent on imported raw dies. Market Overview The ASEAN region is a net-import-dependent market for VCSELs, sourcing over 80% of raw dies from the United States, Taiwan, and Japan, yet it plays a critical role in integration and module assembly for high-speed optical applications. Demand for VCSELs is projected to grow at a compound annual growth rate (CAGR) of 14–18% from 2026 to 2035, driven by hyperscale data center expansion in Singapore and Malaysia and the adoption of LiDAR in Thailand's automotive sector. 100G VCSEL Adoption Regional assembly and test houses, particularly in Malaysia, are ramping up capable packaging lines for 56GBaud and 112GBaud PAM4 modulation, which supports 100Gbps per lane optical interconnects. This trend reflects a shift toward high-power, multi-junction VCSEL arrays, optimized for longer-range LiDAR and industrial automation applications. Singapore-based distributors are also offering pre-tested binned VCSELs to reduce qualification lead times for OEMs in Malaysia and Vietnam, effectively commoditizing standard 850nm 25Gbps parts while maintaining premiums for reliability-graded devices. Applications Driving Growth Data Centers: The rise of cloud computing, AI, and IoT has increased the need for high-speed, low-latency optical interconnects, making VCSELs ideal for 100G data transmission. Automotive LiDAR: Thailand and other ASEAN countries are adopting 940nm high-brightness VCSEL arrays for advanced driver-assistance systems. 3D Sensing and Industrial Vision: VCSELs are increasingly used in mobile face recognition, industrial robotics, and optical biosensing, representing roughly 40% of regional die consump...

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New cavity control strategy improves performance of blue vertical ...

GaN-based vertical-cavity surface-emitting lasers (VCSELs) are promising for displays, sensing and optical communication, but improving efficiency remains challenging. Researchers have

Asia Pacific Vertical Cavity Surface Emitting Laser (VCSEL) Market ...

Based on country, the Asia Pacific vertical cavity surface emitting laser market is segmented into China, India, Japan, Australia, South Korea, and the Rest of Asia Pacific. China

Vertical Cavity Surface Emitting Laser (VCSEL) Market Forecasts to

A Vertical Cavity Surface Emitting Laser (VCSEL) is a type of semiconductor laser that emits light perpendicular to the surface of the device, unlike traditional edge-emitting lasers.

Harnessing the capabilities of VCSELs: unlocking the potential for ...

Vertical cavity surface emitting lasers (VCSELs) have emerged as a versatile and promising platform for developing advanced integrated photonic devices and systems due to their

Vertical-Cavity Surface-Emitting Lasers Market : Global Industry ...

The Vertical-Cavity Surface-Emitting Lasers Market worth USD 2.72 billion in 2026 is growing at a CAGR of 16.6% to reach USD 12.62 billion by 2036. Lumentum Holdings Inc., II-VI

Vertical-external-cavity surface-emitting lasers and quantum dot lasers ...

The use of cavity to manipulate photon emission of quantum dots (QDs) has been opening unprecedented opportunities for realizing quantum functional nanophotonic devices and

Vertical Cavity Surface Emitting Laser technology: A comprehensive

Abstract. Vertical Cavity Surface Emitting Laser (VCSEL) technology has become an indispensable element in optical communication systems and optoelectronics due to its many advantages, and the

Novel energy-efficient designs of vertical-cavity surface emitting ...

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Vertical-Cavity Surface-Emitting Lasers (VCSELs)

This comprehensive report provides an in-depth analysis of market trends, drivers, and forecasts, helping you make informed business decisions. The report includes the most recent global tariff

Operating Principles of VCSELs

Operating Principles of VCSELs Rainer Michalzik and Karl Joachim Ebeling University of Ulm, Optoelectronics Department, D-89069 Ulm, Germany Abstract. In this chapter we will deal with major

Compound Semiconductor Chip Market: 2024 Growth Analysis

Furthermore, GaAs is extensively utilized in optical communications, forming the basis for Vertical-Cavity Surface-Emitting Lasers (VCSELs) and other optoelectronic devices essential for

200G VCSEL Development and Proposal of Using

The connectivity demands of high-performance computing (HPC), artificial intelligence (AI) and data centers are driving the development of a new

Vertical-cavity surface-emitting lasers: present and future

This manuscript reviews the present status of "commercial- grade," state-of-the-art planar, batch-fabricable, vertical- cavity surface-emitting lasers (VCSELs). Commercial-grade performance

Latest advances in VCSEL technology for next-generation data center ...

Directly modulated vertical-cavity surface-emitting lasers (VCSELs) have long dominated the data center optical intercon-nect market, attributed to VCSELs' cost-effectiveness and energy efficiency.

Vertical Cavity Surface-Emitting Laser (VCSEL) Market Report 2026

A Vertical Cavity Surface-Emitting Laser (VCSEL) is a semiconductor device that emits a laser perpendicular to its top surface. VCSELs find applications in long-distance, high-speed optical fiber

TRUMPF and Optomind present 100 Gbps vertical-cavity surface

Ulm/Frankfurt, September 20, 2024 – TRUMPF Photonic Components, a global leader in VCSEL and photodiode solutions for data communication, and Optomind are showcasing 100Gbps VCSEL

Global VCSEL Chips Market Size, Industry Share & Forecast 2026-2034

VCSEL Chips Market Overview 2026-2033 The Vertical-Cavity Surface-Emitting Laser (VCSEL) chips market represents a critical segment within the broader optoelectronics and photonics

VCSEL Market Size, Share & Forecast | Global Report

A Vertical Cavity Surface Emitting Laser (VCSEL) is a semiconductor-based laser diode that produces light perpendicular to the surface of the fabricated wafer rather than parallel as in edge

VCSEL: Vertical Cavity Surface Emitting Laser Explained — Structure ...

VCSEL technology emerged to address limitations associated with edge-emitting lasers, particularly in manufacturability, coupling efficiency, and array scalability. Early research in the 1980s

Vertical Cavity Surface Emitting Laser Market | Analysis...

The Vertical Cavity Surface Emitting Laser (VCSEL) Market was valued at 4.71 (USD Billion) in 2025 and is projected to grow to 10.0 (USD Billion) by 2035, at a CAGR of 7.8%.

Vertical-Cavity Surface-Emitting Lasers Market in ASEAN | Report ...

The ASEAN market for Vertical-cavity surface-emitting lasers is best understood as a high-throughput integration and consumption zone rather than a primary manufacturing locus for raw

Vertical-Cavity Surface-Emitting Lasers Market in ASEAN | Report ...

The ASEAN region is a structurally net-import-dependent market for Vertical-cavity surface-emitting lasers (VCSELs), with over 80% of raw dies sourced from fabs in the United States,

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